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educated, quite irrespectively of the linguistic affinities of their native tongues.

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### MOTOR RELATIONS OF SPEECH AND IDEA.

Listening to a casual conversation in some foreign tongue gives us an impression in which even the word spacing escapes notice, so that we speak of hearing the "chatter" of Turkish, of Japanese, just as we refer to our perception of the sounds of birds. This paper desires to carry onward some studies in which motor equations are substituted for an understanding of the basis of expression of ideas as sound in words. The expression of signs in words, coming down through the employment of pictures to arbitrary marks is not a parallel study. But it seems interesting to compare, if possible, all languages upon a basis of movements, muscular and osseous. That one movement should be selected and not another is evidently a matter less of chance than convenience. Birds having no teeth will not enunciate dental equivalents. On the other hand, a preference for dental equivalents among a vast majority of languages may indicate a group idea having a basic muscular value.

To eat suggests taste. To eat suggests having within the mouth. So teeth, cheeks, lips, tongue and palate are concerned. But teeth, to a mammal suggest in an especial manner the function of eating. The teeth bite off, as well as chew, so that a word "to eat" without a dental sound might be quite avian, but scarcely mammalian. Eating is not performed in the pharynx, or throat. A guttural letter would scarcely denote the verb "to eat," although in a too hasty swallowing, as "to gulp," we recognize the fitness of the word.

Let us preface a table of the chief consonants:

1. Labial: *p—b—ph (f)—bh (v)*.
2. Lingual: *t—d—th—dh*.
3. Guttural: *k—g—kh—gh*.
4. Sibilant: *s—z—sh—zh (French j)*.
5. Compound: *ts—dz—tsh (ch, in church)—j (English)*.

The liquids and others:

- |                         |                            |
|-------------------------|----------------------------|
| 1. Labial: <i>m—w</i> . | 2. Lingual: <i>n—l—y</i> . |
|-------------------------|----------------------------|

3. Guttural: *ng—r—h*.                      4. Sibilant: — — —  
 5. Compound: *gn* (*gn*, French) [*companion*, English].

In the lingual group we may include palatals and dentals as of common source, although to carry out the most detailed study they would require sub-analysis.

"TO EAT," SEVERALLY STUDIED.

English: <i>eat</i> , = <i>t</i> .	Greek: <i>esthio</i> = <i>sth</i> .
Italian: <i>mangiare</i> = <i>dzh</i> .	Latin: <i>edere</i> = <i>d</i> .
French: <i>manger</i> = <i>zh</i> .	Russian: <i>yest</i> = <i>st</i> .
German: <i>essen</i> = <i>ss</i>	Japanese: <i>tabe</i> = <i>t</i> .

"TO SWALLOW, TO DRINK, TO GULP."

English: <i>gulp</i> = <i>g</i> .
Italian: <i>inghiottire</i> = <i>gh</i> ( <i>g</i> , hard).
French: <i>gober</i> = <i>g</i> .
German: <i>schlucken</i> = <i>k</i> ( <i>ck</i> ).
Greek: <i>katabrochthizo</i> ( $\sqrt{\text{bronchus}}$ ) = <i>ch</i> .
Latin: <i>glutio</i> = <i>g</i> ( <i>gl</i> ).
Russian: <i>glotokh</i> and <i>glonutye</i> = <i>g</i> ( <i>gl</i> ).
Japanese: <i>nomi-komi</i> = <i>k</i> .

(*Nomi* means "to drink." The *komi* is alliterative modulating the *n*, a lingual, to a *k*, a guttural.)

These lists could be extended. It is evident that onomatopoeisis would not account for simple muscular movements in themselves not vocable.

Following this plan, as in a previous paper<sup>1</sup> suggested, the labials are sounds of approach, of affection, of prehension. The dentals (linguals) are sounds of distinction, of definition, of limitation. The gutturals are sounds of imbibition, of assimilation, of emotion, and are of lower mental status, coarse and less imaginative, less detailed, and less reasoned than the dentals.

To find a sound of past tense, a sound which would limit the verb to a particular time, past, just past, or just passing, we find no better element than a dental (lingual).

PAST PREFIX, SUFFIX, OR FORM.

English: <i>ed</i> , <i>d</i> , <i>t</i> , <i>en</i> , <i>n</i> .	Latin: <i>atus</i> , <i>tus</i> .
French: — — —	Greek: <i>menos</i> , <i>tos</i> .
German: <i>te</i> , <i>en</i> , <i>n</i> .	Italian: <i>ato</i> , <i>ito</i> , <i>uto</i> .

<sup>1</sup> "Some Curious Psychosensory Relationships," *The Monist*, XVII, 128.

Russian: *l*.  
Japanese: *ta*.

Polish: *l*.

## PRESENT PARTICIPLE (JUST PASSING), ACTIVE.

English: *ing, ng*.  
French: *ant*.  
Italian: *ante, ando*.  
German: *end*.

Latin: *nt, ns*.  
Greek: *ont, n*.  
Russian: *ya, shtsh*.  
Polish: *ts*.  
Japanese: *te*.

From such isolated examples, chosen however among commonplace and colloquial words, no fixed rule could be posited. Nor could any definite rule be asserted. It may, nevertheless, afford the anatomical basis of a relationship between word and idea. Not only in the necessary processes of cerebration, but in the entire nerve-muscle reaction there may occur a definite substratum of necessity in the choice of sounds. This would give us a rational basis for the study of animal sounds in general. A hen's clucking when she calls her little chickens sounds as though her muscles of deglutition were involved in the production of the sound.

The elements of inflection in a language require keener analysis. Chance, or association, may apparently reverse a rule.

Strangely enough, in studying these principles, on reading Japanese, a striking similarity among the words of common usage in that Ural-altaic tongue and German, Italian and Greek roots becomes apparent. This will be seen from the table which is appended to this article, and which could be materially extended. Over one hundred of the common 400 colloquial words in Japanese show a Greco-Latin influence of the consonantal type here outlined. It was the philologist Grimm who said that a similar sound was of more significance than a similar spelling. Müller, too, followed such assonances.

Japanese employs an ending, *tsu*, the *u* being comparable to our French and English *e* silent. This *tsu* has the value of Italian *-zio, -anzio, -angia, -ancio*, etc., and of the French and the English *-ance, -ence*. Here we see the *u* is lost but the *c* equals a *ts*. German and Russian use a *tz* in a similar purpose to close a word. Not only can this be found, but the Japanese *-sa*, used for substantives derived from the adjective ending *shii* (as in Russian, and the *sch* of German) may be no more than a weakened *ts* plus *a*. The

use of a *ts* or *s* to denote nouns by derivation is the employment of a final dental which in verbs as *d* or *l* closes action, and in nouns encloses space.

The present linguistic dissector would enjoy extending this communication. He has abundant material in the form of notes from which a future hour may be permitted to draw. Before closing he would like to inquire whether the Turkish suffix of verbal infinitive mode, *-mak*, *-mek*, can be related to the German *machen*, "to do," "to make."

In view of the pronounced affinity of Rumanian to Italian, can the Ural-altaic Japanese be related across the Caucasus?

The theory of anatomic necessity in vocalization may prove a solid basis of investigation. Modern phonetics classifies more than ever all vocables according to structural enunciation.

COMPARATIVE TABLE OF ROOTS.

ENGLISH	JAP.	GREEK	SANSK.	GERMAN	RUSSIAN	LATIN ROMANIC
generate } grow }	<i>gen</i>	<i>gen</i>	<i>gen</i>	<i>gin</i>		<i>gen</i>
obscure	<i>ku</i>	<i>sko</i>	<i>sku</i>			<i>scur</i>
come	<i>iki</i>	<i>heko</i>		<i>kommen</i>		
(go) exit	<i>iri</i>					<i>ire</i>
here	<i>achi</i>					<i>aqui</i>
are (to be)	<i>are</i>	<i>histami</i>		<i>aron</i>		
beautiful	<i>bi</i>					<i>bello</i>
base (bottom)	<i>batsuza</i>					<i>bas</i>
-logy	<i>-gaku</i>	<i>logos</i>				<i>-logia</i>
healing	<i>i</i>	<i>iatr</i>				
medicine (sci)	<i>i gaku</i>	[ <i>iatrology</i> ]				
boorishness	<i>burei</i>					
same (ditto)	{ <i>demo</i> <i>do</i>					{ <i>medesimo</i> <i>detto</i>
dominee (mr)	<i>don</i>					{ <i>don</i> <i>dominus</i>
locality	<i>ho</i>	<i>lech</i>				<i>locus</i>
(genit. relation)	<i>no</i>	<i>on</i>				
(adj.) -an, -ian	<i>na</i>	<i>-anos</i>			<i>-a, -ya</i>	<i>-anus</i>

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